

# ASD Weekly Highlights for the Week Ending 28-July-2006

## Operations

### July 22-28

From 22-JUL-2006 to 28-JUL-2006

Request Type	Hours	Percent Beam Activity
Beam Time to Target	88.00	52.38
Planned Shutdown (no Beam, no Testing)	44.00	26.19
Testing (Machine on, no Beam, e.g. RF Processing)	36.00	21.43
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<b>Total Beam Activity Requested</b>	<b>168.00</b>	

Recorded Activity Type	Hours	Percent of Total
Beam Time (delivered to Target)	65.30	48.84
Machine Startup (from a Planned Shutdown)	1.40	1.05
Machine Studies (R&D)	2.50	1.87
Machine Studies (remedial - to recover Beam Time)	2.50	1.87
Planned Shutdown (no Beam, no Testing)	38.00	28.42
Testing (Machine on, no Beam, e.g. RF Processing)	24.00	17.95
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<b>Total Activity Recorded</b>	<b>133.70</b>	
<b>Total Planned Beam Time</b>	<b>99.60</b>	
<b>Total Downtime Recorded</b>	<b>34.30</b>	<b>34.44</b>

#### Equipment Breakdown by Group and SubGroup

Group	SubGroup	Hours	%
Controls	ICS Network	.50	1.46
Diagnostics	BLM - Beam loss monitor	1.00	2.92
Electrical Systems	HVCM	15.30	44.61
Cooling Systems - Accelerator, Target	DI	12.00	34.99
Cooling Systems - Accelerator, Target	RCCS	5.50	16.03

## Accelerator Physics

- The physics program has supported beam to target runs, and beam studies. Highlights from the beam studies program were:
  - o Demonstration of long pulse (475 m sec) beam through the linac and HEBT with low loss
  - o Injection dump line waste beam (H- and H0) studies confirmed predictions on the waste beam separations for various alternate chicane setups.
  - o A major contribution to the beam tilt at the target was identified as a simple result of the tunes and painting scheme. Separation of the tunes, and longer painting times alleviate the tilt.
- With the help of a visitor from KEK (Etienne Forest ), the ORBIT tracking code was merged with the PTC particle tracking code. The marriage of ORBIT's space charge and impedance modeling capability with PTC's symplectic particle tracking capabilities offers a powerful suite.

## RF Systems

### LINAC RF

- John De Baca, a technician in the group since March 2004, terminated his SNS employment July 28.
- Took occupancy of the RFTF Annex (Bldg. 8320). Klystrons and associated equipment have been moved from RATS-II to 8320 where they will be prepared to serve as ready spares.
- There is significant progress in the construction of RFQ coupler test stand and prototype high-power vector modulator. Hardware is being received and assembled.
- There was ongoing assembly, testing and calibration of Low-Level RF spares.
- Participated in SRF Task Force activities.

### Ring RF

- We removed 10 dB of attenuation from the input of the power amplifier chain for Station RF13. We adjusted LLRF control parameters to provide stable system operation. With these settings the final amplifier can provide currents in excess of 65 amperes and should give this station the ability to control beam intensities approaching  $1e14$  protons per pulse.
- We will try these parameters with beam during the next high intensity development period.

## Ion Source

## Instrumentation and Controls

PPS work for RF test facility:

- Hazelwood electricians are routing cable trays
- PPS cable has been received and delivered to the RF test facility
- Sketches showing field devices, field cabling, and control panel layout have been generated
- Purchase orders have been made for PPS field devices and control panel components

- Hazelwood electricians plan to run conduit and start pulling cable next week

## **Instrumentation and Controls**

- The principle activity this week was supporting operations, although there were very few calls or system problems.
- SRF Test Facility Work: PPS, Cryogenic Controls, and Network cables have been received. Hazelwood electricians are currently routing cable trays. ICS cable installation will start next week. Preliminary drawings showing cable routing, termination, and control panel fabrication have been developed. Most equipment and components required for cryogenic controls have been received. Purchase orders for PPS field devices and control panel components have been prepared.
- Currently, several of the stepper motors used in motion control for the foils, scrapers, and SCL cryomodule tuners are interfaced to the control system via a VME OMS board, custom transition modules, and custom hardware interface chassis. A PLC based motor driver is being tested for use in SCL tuner motor control. Preliminary results are very positive. This PLC based tuner motor control will be installed in the SRF Test Facility. It is much easier to install and wire. No expensive custom components (with obsolete parts) and cables are required.
- Target Test Facility: A means to back up the Target Test Facility data files have been found. The TTF control system was the first EPICS system developed for SNS and is quite out-of-date. Only minimal updates have been made over the years. The importance of the TTF control system is increasing because of plans to use the facility to make improvements to the target. The control system will be upgraded to more closely match the system in use at the SNS site.
- Channel Access security for the Vacuum and RCCS IOCs has been updated and is ready to download. These IOCs will be rebooted on the next maintenance day. The cause of vacuum faults on 2 SCL was diagnosed and corrected. A third vacuum fault will be investigated on the next maintenance day. An updated version of the SCL vacuum asyn driver is available and will be installed and tested.
- The Ring HPRF PanelView code was successfully tested and will be installed during the next maintenance period

## **SRF Facility**

## **Project Upgrade**

## Survey and Alignment

- **LINAC:**
  - Linac alignment verification campaign is now complete. We will present the results to the project next Thursday.
- **RING/RTBT:**
  - S & A marked the location of the bolt holes the gamma blockers stands in both the RID and also the RTBT.
  - During the next maintenance day, we will align and level the stands.
- **TARGET:**
  - BL 3: Marked forms for (and set position of) downstream “get lost” tube. Performed as-built survey of downstream end of BL3 floor space.
  - BL 6: Tied previous as-built surveys of adjacent beamlines together into the BL 6 coordinate system.
  - BL 11: Set center of secondary shutter. Set downstream plate. Determine distance between middle and downstream plates. Located centerline of boltholes on downstream plate. Performed as-built survey of guide window on 11A. Set the first pair of bridge weldments.
  - BL 15: Located edge of monolith shelf and floor chases. Located reference lines for adjacent beamlines to check for encroachment of the proposed cave design. Re-chalked theoretical bisectors for tour of area.

## Cryo Systems

## Mechanical Systems

**Water**

**Vacuum**

**Mechanical**

## Electrical Systems

### Power Distribution and Cabling

- Finalized and issued engineering drawings for site-wide outdoor PA
- The following generators have been added to the power monitoring: KL-2EG1, KL-4EG1, and RN-1EG1
- Calculations for lighting requirements in CLO Lab D-G13 (Machine Shop). Ordered replacement light fixtures.
- Review and Approval Main Single Line Diagram and Feeder Schedule.
- Review of Fire door hold open requirements for CLO doors at J-200, J-205, B-241 and C-242.
- Review of SKM Electrical System Modeling software and SNS models.

- Provided estimate for adding six poke through floor receptacles in CLO conference room C-156.
- Reviewed and Approved Grounding submittal for Target BL-5 and 7.
- Final punch list inspections of SRF, GAP, and Auditorium contracts
- Oversight of Chestnut Ridge Project ( manhole #48 is in place ) and work is expected to start today on duct-bank from MH # 40.
- Worked with Charlie Bruce to de-energize 13KV line so street lights can be installed at CNMS.
- Submitted proposed Schedule Sub station, panel maintenance and research mechanic work load to George and Tom Mann for September maintenance period
- Met with Diagnostics to create SRO and locate equipment, meet with Herb Strong to locate equipment or signal cable pulls for test cave.
- Submitted required information for BL 15 to outside Designers
- Completed on design drawings for vacuum system upgrades to Ring, HEBT and RTBT.

#### Modulator

- Met with vendor to inspect capacitor grounding sticks for appropriate testing requirements.
- Modified transformer subcontract to address leakage inductance tolerances and system capacitor variations after extensive Monte Carlo circuit analysis.
- Measured existing transformer leakage inductance using ANSI/IEEE Std. 390 techniques to support Stangenes Industries design effort
- Performed switch card replacement of DTL-Mod5 and troubleshooting of CCL-Mod4
- Corrected flow switch interlock problem on MEBT chopper loads and ran chopper pulsers into loads (w/o structure in circuit). Pulsed power circuit performed flawlessly at 2 kV for a sufficient duration to convince me pulsers/loads are not the source of the breakdown problem we've been observing. Mechanical Systems Group has started preparing conditioning of spare MEBT chopper structure in anticipation of a future replacement, although this conditioning will take some time based on LANL's experiences.
- Met with maintenance coordinator to discuss barcoding for tracking HVCM availability/MTBF. System appears in good shape but still needs work to make it a useful tool for ease of use in the field and statistical analysis of results.
- Repair CCLMod-4 IGBT failure
- Repair DTLMod-5 B+ Driver card failure
- Installed Water leak detectors on CCLMod1 – 4 and SCLMod-1 -12
- Finished and tested IGBT assembly for shipment to SLAC

#### Power Supplies

- Performed LOTO in the ring service building, and RTBT service buildings in preparation for maintenance activities
- Responded to a fault report from the control room about injection kicker V04, found a blown fuse on the 24 VDC power supply
- Had the oil pump on extraction kicker PFN tank #2 was replaced